

Robotic Cystectomy : Important considerations before commencing the procedure independently

Nikhil Vasdev, Ben Lamb, Tim Lane, Gregory Boustead, James M Adshead

Hertfordshire and South Bedfordshire Urological Robotic Centre, Department of Urology, Lister Hospital, Stevenage, UK

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Scientific Note

A radical cystectomy (RC) with pelvic lymph node dissection (PLND) is the gold standard for the management of the appropriately selected patient with muscle invasive bladder cancer (MIBC) and non-muscle invasive bladder cancer (NMIBC)/carcinoma in situ (CIS) who fail appropriate intravesical therapy. In the last decade, Robotic Radical Cystectomy (RRC) is being performed in a large number of international Centres with the published advantages of decreased blood loss, improved post-operative convalescence and earlier initiation of adjuvant therapy¹ when compared to open cystectomy (OC). Current literature indicates that a RC is equivalent to OC from the oncological perspective. An OC is associated with high rates of morbidity (19–64%) or mortality (6–11%), although there is a wide variation in current literature.^{1–11} A RRC is perhaps just one modality in a raft of measures to try reducing mortality and morbidity of a cystectomy.

To the Robotic Urological Surgeon, a RRC comes with numerous specific challenges. Questions that arise at the time of commencing a RRC include the learning curve of the procedure, learning steps to enhance one's speed to perform the procedure efficiently and safely, level of lymph node dissection, whether one should embark on performing an intracorporeal conduit or neobladder formation and the cost of commencing a RRC service. The patient's postoperative management is the most important step to ensure that the post-operative complications are kept to a minimum using a multi-disciplinary team (MDT) approach.

In current literature high volume centers with experienced surgeons have reported patient outcomes that are acceptable from the perspective of extended pelvic lymph node dissection, positive surgical margin rates and highlight that patients are not being compromised from the surgical perspective in undergoing a RC.²

The learning curve of a RRC is not as clearly defined in comparison to Robotic Radical Prostatectomy (RRP). Before commencing a RRC it is important to be proficient and familiar with robotic pelvic surgery. Most robotic surgeons are proficient in RRP before embarking on performing independent RRC. Hayn *et al.*³ have indicated that an acceptable level of proficiency to perform a RRC is established after the 30th case by measuring post-operative parameters such as operative time, lymph node yield (LNY), estimated blood loss (EBL), and margin positivity. At our center we commenced performing RC after performing 150 Robotic RRP. We would strongly recommend that a robotic urological surgeon who is keen to commence Robotic RC should be proficient in robotic RRP and in performing an extended pelvic lymph node dissection (EPLND). A well-trained Robotic Team consisting of the lead experience console surgeon, experienced assistant, nursing staff and an experience anesthetist is essential for the commencement of a RRC program. The techniques that a team needs to develop to aid in improving intra-operative times including a fast docking/undocking time, piggyback techniques for ports and the use of different specimen retrieval bags, use of laparoscopic staplers and new intraoperative hemostatic agents.

Whilst performing an adequate RRC involves the removal of the bladder, the importance of performing an EPLND cannot be understated. There is no defined lymph node dissection template for a RRC and some centers now perform an EPLND before performing the robotic cystectomy during a RRP.⁴ The anatomical landmark that we recommend to be followed is up to the level of the aortic bifurcation or the Inferior mesenteric artery (IMA), lymph node of cloquet distally, genitofemoral nerve laterally and perivesical tissue laterally. Using this template the surgeon will be able to excise the external iliac, obturator, hyogastic and common

Corresponding author: Nikhil Vasdev, FRCS (Urol); Hertfordshire and South Bedfordshire Urological Robotic Centre, Department of Urology, Lister Hospital, Stevenage, UK.
Email: nikhilvasdev@doctors.org.uk

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iliac. Some authors⁵ recommend the excision of the presacral lymph node as the excision of this lymph node group facilitates the transposition of the left ureter behind the sigmoid mesentery to aid in intracorporeal anastomosis.

With an evolution in robotic systems there has been an increase in the number of patients undergoing intracorporeal ileal conduit and neobladder formation. The excellent technical description of the procedure has led to the adoption of these techniques worldwide.⁵ We have recently published the results of our initial patients.⁶ Robotic surgeons must be proficient in the performing the cystectomy part of the RRC before embarking on either an intracorporeal ileal conduit or neobladders formation due the complications of keeping patients in the steep Trendelenburg position for prolonged periods, which include compartment syndrome, neurological complications, intraocular complications, and rhabdomyolysis.^{7,8} Recent evidence from high volume centres performing RRC and intracorporeal neobladders diversion confirm that initial results are comparable to contemporary open series with regards to complication rates, functional and oncological outcomes.⁹ We recommend that a surgeon should embark on performing an intracorporeal ileal conduit and neobladder formation only if the ablative part of RRC is less than 2.5 hours of total operative time. If the ablative times are longer we recommend performing a mini-laparotomy for excision of the cystectomy specimen and completing an extracorporeal ileal conduit or neobladders.⁶

The cost effectiveness of a RRC when compared to an open radical cystectomy (ORC) has a disadvantage of being more expensive due to the initial high purchase and maintenance contract cost, although when the indirect costs of complications and extended hospital stay with ORC are considered, RRC may be less expensive than the traditional open procedure. In order to accurately evaluate the cost effectiveness of RRC versus ORC, prospective randomized trials between the two surgical techniques with long-term oncologic efficacy are needed.¹⁰

In conclusion, a RRC with intracorporeal ileal conduit or neobladders formation is a complex robotic procedure that should only be undertaken by an experienced robotic pelvic oncological surgeon who is completely competent at performing a RRP + EPLND. A carefully mentored approach and a well-trained robotic team are the two key components to make the procedure a success.

Competing interests

The authors declare that they have no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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